

Chapter One

Introduction and Setting the Context

Key Learning Points

- ⌘ Global warming happens when we overload the atmosphere with carbon. We're putting too much carbon where it doesn't belong.
- ⌘ Fremont will rely heavily on implementation of many State and regional initiatives in order to make significant progress towards its goal for reducing greenhouse gas emissions.
- ⌘ The City organization and the community at large can build on many successful achievements to date which have resulted in emission reductions.

Introduction

The City of Fremont's *Climate Action Plan* (CAP) is the latest initiative in the City's ongoing commitment to confronting the issue of climate change, the most wide-ranging and profound challenge facing the world today. Like many other elected officials at the local level, the Fremont City Council placed a high priority on the preparation of the Climate Action Plan, the first of its kind for the City and for which research, development and writing occurred between 2009 and 2011, concurrent with the comprehensive update of the City's General Plan (adopted in December, 2011).

The ever-evolving and swiftly-changing policy and regulatory landscape concerning greenhouse gas emissions has created an exciting, while often challenging, context for preparation of the Climate Action Plan. The lack of action at the federal level continues to stymie a comprehensive, national approach to achieving emission reductions. However, California, which has a history of leadership in energy conservation, environmental regulation, and support for research and development of innovative practices and new technologies, is also a leader in combating climate change. As the 15th largest city in the state, and the fourth largest city in the San Francisco Bay Area, Fremont can look throughout California to other public agencies at all levels of government, as well as the private, not-for-profit, and educational sectors, for information exchange, advocacy, and support for maximizing limited funding and staff resources through partnerships and collaborations to achieve the ultimate desired outcome: reductions in greenhouse gas emissions.

The critical role of local government in this work has been widely acknowledged. Figure 1-1 illustrates the areas where local governments can, through planning, regulatory, and leadership actions, foster reductions in both governmental and community emissions. (While this figure includes water and wastewater systems, these services are provided to Fremont citizens by agencies other than the City of Fremont).

Figure 1-1

Opportunity Areas for Reducing Greenhouse Gas Emissions

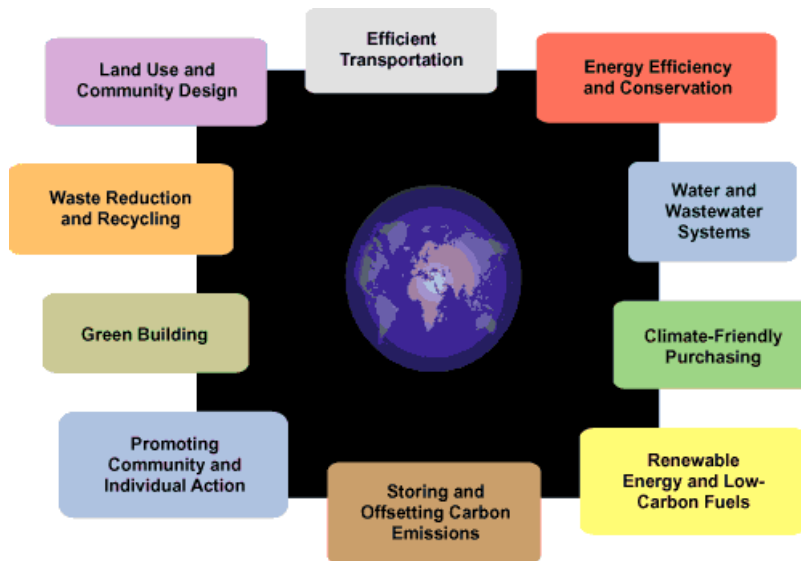


Image source: Institute for Local Government (image copied from the California Air Pollution Control Officer (CAPCOA) publication 'Model Policies for GHGs in General Plans', June 2009, p. 29).

This climate action plan includes strategies to achieve greenhouse gas emission reductions characterized along a 'continuum of actions' for intervention by the City of Fremont. This continuum positions the City to *advocate, collaborate, promote and encourage, and regulate*, as appropriate to the specific action. Of course, multiple approaches may be most effective for some initiatives; for example, the City can both *advocate for* and *regulate* various Green Building programs.

Development of the Climate Action Plan

The development of the Climate Action Plan grew out of the work of the Green Task Force (GTF), a citizen group appointed by the City Council. On July 22, 2008, the GTF presented twenty recommendations to the City Council that focused on seven categories, including transportation, land use and community design, economic development, waste reduction and recycling, public outreach and education, energy efficiency and conservation, and storing and offsetting carbon emissions. As a follow-up, on September 13, 2008, staff hosted a well-attended Climate Action Workshop to receive public input on the GTF's recommendations. On November 18, 2008, the City Council approved staff's recommendations on the GTF's recommendations, and adopted

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the City's goal to reduce greenhouse gas emissions 25% by 2020 from the 2005 baseline.

Through the General Plan update process, the community provided comments, and the City Council has provided direction, on many goals, objectives and policies which are relevant to achieving greenhouse gas emission reductions. These goals, objectives and policies will be addressed in broader terms in the General Plan, and in more specific terms in the Climate Action Plan. The Climate Action Plan is required by State law to be consistent with the General Plan, and, although developed concurrently with the General Plan, can be viewed as an implementation program of the General Plan.

The City Council's role in the development of the Plan is summarized below:

- **2008:** Directed staff to prepare a climate action plan; adopted goal of reducing the community's greenhouse gas emissions by 25% from 2005 levels by the year 2020.
- **2009:** Approved work plan for climate action plan. Authorized the Mayor to sign the Bay Area Climate Collaborative Charter of the Bay Area Climate Change Compact.
- **2009:** Held joint work session with the Fremont Unified School District Board of Education, which included a staff presentation on the Climate Action Plan project.
- **2010:** Held work session to review list of proposed actions for reducing greenhouse gas emissions in the community and municipal operations.
- **2011:** Reviewed modified list of proposed actions for reducing greenhouse gas emissions, and draft chapters of the Climate Action Plan.
- **DATE TO BE INSERTED:** Adopted final Climate Action Plan.

During development of the Climate Action Plan, staff met twice in 2009-10 with an ad hoc citizen group which included members of the youth community, the Green Task Force, and others who had previously expressed an interest. On November 6, 2010, staff held a session on the Climate Action Plan as part of the larger General Plan Update workshop held that day.

Internal to the City of Fremont organization, a cross-departmental working group met regularly to discuss the CAP, focusing primarily on developing the lists of recommended actions for reducing greenhouse gas emissions which form the heart of the CAP. In addition, City staff worked with representa-

tives of other public agencies such as Union Sanitary District and the Alameda County Water District, in identifying collaborative opportunities for achieving greenhouse gas emission reductions.

Relationship to the General Plan

The Climate Action Plan is consistent with the goals and policies in the General Plan, as required by State law. The CAP provides the specific strategies for working towards achieving the City's greenhouse gas emission reduction goal, and reinforces the principle of sustainability which underlies the General Plan: "Sustainability is generally defined as the ability to meet the needs of the current generation without compromising the ability of future generations to meet their needs. In practical terms, a sustainable approach reduces resource consumption, avoids pollution, develops in harmony with the environment, and helps people live healthier lives." (Sustainability Element, p. 1-3)

Purpose of the Climate Action Plan

Scientists state unequivocally that the earth is warming. Climate change is happening, it is caused in large part by human activity, and it will have many serious and potentially damaging effects in the decades ahead.¹

Since the early 1990s, international scientific consensus holds that greenhouse gases which are by-products of human activities, such as energy use, fossil fuel combustion, waste disposal, and land use changes, are being released faster than the Earth's natural processes can absorb them.

This is the challenge driving the preparation and implementation of the City of Fremont's Climate Action Plan.

Changes in the earth's temperature will have impacts for Fremont. These impacts could include:

- ∞ Increased heat waves
- ∞ Increased annual rainfall of 20 to 30 percent leading to more serious storm events
- ∞ Rising sea levels that will threaten coastal infrastructure, ecosys-

¹ Pew Center on Global Climate Change and the Pew Center on the States. *Climate Change 101: Understanding and Responding to Global Climate Change*, January 2009.

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tems, and water supplies

- Decrease in the Sierra snow pack that will affect fresh water availability
- Increase in insect-borne diseases
- Impacts to public health.

Although no one city can independently resolve the issue of climate change, Fremont can make a positive impact through leadership and cumulative local action in the areas of effective land use and transportation planning, wise waste management and water use, and the efficient use of energy, all resulting in greenhouse gas emission reductions. This Climate Action Plan, the first of its kind for the City of Fremont, includes the list of actions to guide both the City organization and the community as a whole towards the achievement of the City Council's adopted greenhouse gas emission reduction goal of a 25% reduction below 2005 levels by the year 2020.

The overarching goals of the Climate Action Plan are twofold:

First: To identify specific and achievable actions for reducing greenhouse gas emissions in Fremont. Greenhouse gases trap heat in the atmosphere and contribute to the warming of the planet. There are many reasons to reduce greenhouse gas emissions, including:

- Minimizing their negative effect on climate change
- Protecting and improving the natural environment, both flora and fauna
- Reducing dependence on fossil fuels and promoting national security
- Diversifying energy sources
- Conserving energy, thereby saving money
- Protecting and enhancing public health
- Creating new jobs and supporting a healthy economy.

Second: The Plan will serve as a resource for the continued engagement, education motivation and inspiration of the community and City organization as we work together on this critical initiative.

Overview of climate change science, global warming, and the greenhouse effect: *Our Earth is heating up, and it is heating up quickly*



This section provides an overview and definition of concepts and terms relevant to the Climate Action Plan.

Climate change refers to long-term variation in the average weather patterns at a global or regional level, over time frames ranging from decades to millions of years. Average weather patterns include temperature (both increases and decreases), precipitation (such as rainfall and snow), and wind patterns. Climate change may result from the Earth's natural internal processes, or from 'external forcing', which refers to forces, such as volcanic eruptions, solar variations, and human activity (known as 'anthropogenic climate change') that cause a change in the climate system.

Greenhouse gases are so named because of the 'greenhouse' properties they exhibit: allowing sunlight to enter Earth's atmosphere, absorbing the infrared radiation (heat) which results when sunlight is reflected off the Earth's surface, and trapping this heat in the atmosphere. The Earth's surface temperature remains generally constant when, over time, there is a balance between the amount of energy sent from the sun to the Earth's surface as the amount of energy radiated back into space. The naturally occurring greenhouse effect, then, allows the Earth to be a habitable environment.

There are many gases which exhibit 'greenhouse' properties; examples include those occurring in nature, such as water vapor, carbon dioxide, and methane, and those which are exclusively human-made, such as gases used for aerosols. Since many greenhouse gases last decades or even centuries, their contribution to the enhanced greenhouse effect is a problem that cannot be quickly eliminated.

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Global warming refers to the progressive gradual rise of the Earth's average surface temperature, and is linked to the enhanced greenhouse effect.

The **enhanced greenhouse effect** is the concentration of atmospheric greenhouse gases which leads to an increase in the amount of infrared or thermal radiation near the Earth's surface. Decades of research by scientists in a multitude of disciplines has resulted in agreement among a majority of the scientific community that average global temperature is increasing at a rate that is unprecedented since people began measuring global temperatures. The National Oceanic and Atmospheric Administration (NOAA) notes that seven of the eight warmest years on record have occurred since 2001.² Within the past 30 years, global warming has occurred at a rate approximately three times greater than that recorded over the last century.³ Figure 1-2 illustrates the greenhouse effect.

Figure 1-2
The Greenhouse Effect

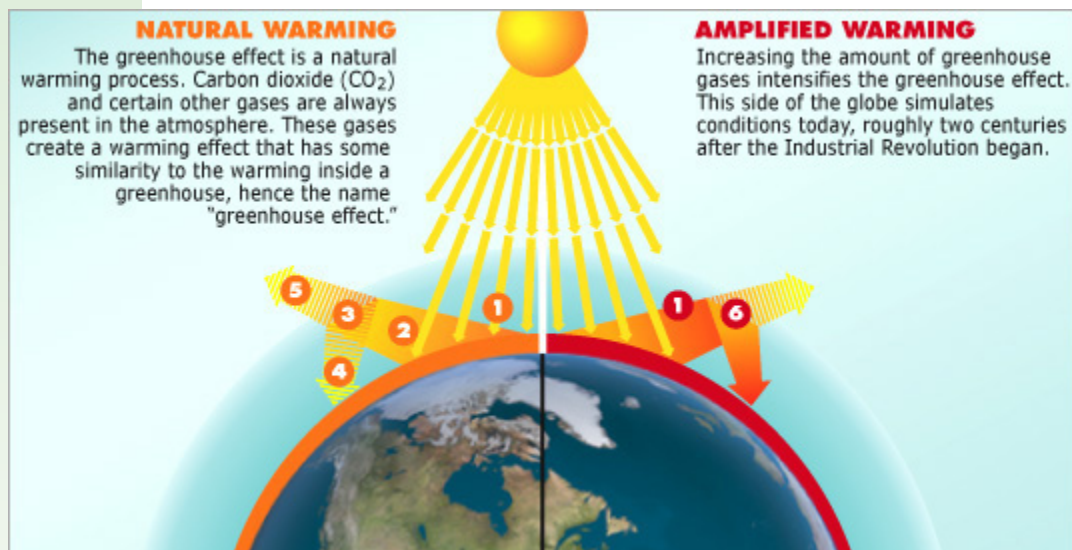


Image source: The National Academy of Sciences

“Visible sunlight passes through the atmosphere without being absorbed. Some of the sunlight striking the earth (1) is absorbed and converted to heat, which warms the surface. The surface (2) emits infrared radiation to the atmosphere, where some of it (3) is absorbed by greenhouse gases and (4) re-emitted toward the surface; some of the heat is not trapped by greenhouse gases and (5) escapes into space. Human activities that emit additional greenhouse gases to the atmosphere (6) increase the amount of infrared radiation that

² U.S. EPA, “Frequently Asked Questions about Global Warming and Climate Change: Back to Basics”, April 2009, p. 2.

³ Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report, 2007.

gets absorbed before escaping into space, thus enhancing the greenhouse effect and amplifying the warming of the earth.”⁴

It is important to emphasize, however, that global warming is about more than just temperature; it is also about weather patterns that make up our climate, including rainfall patterns, storms, and wind. The stability of these patterns affect every aspect of life, and “if the climate shifts, it is like the ground shifting with very dramatic consequences.”⁵

Regulatory Context

This section provides an overview of the regulatory context at the federal, state, and regional levels relevant to the City of Fremont’s actions towards reducing greenhouse gas emissions.

Federal context

The Pew Center on Global Climate Change describes the United States’ role in the production of global greenhouse gas emissions in the following:

The United States, with 5 percent of the world’s population, is responsible for 18 percent of global greenhouse gas emissions. . . . On a per capita basis, U.S. emissions are roughly twice as high as those of the EU (European Union) and Japan (and four times the world average) . . .

Emissions are rising fastest in developing countries. China’s and India’s emissions are projected to grow 71 percent and 68 percent, respectively, by 2020. Annual emissions from all developing countries surpassed those of developed countries in 2004. Their per capita emissions, however, will remain much lower than those of developed countries. Looking at emissions on a cumulative basis, the United States accounts for 30 percent of energy-related carbon dioxide emissions since 1850, while China accounts for 7 percent. ***Cumulative emissions are an important measure because of the long-lasting nature of greenhouse gases in the atmosphere. Although developing country emissions are rising, their cumulative emissions are not projected to reach those of developed countries for several more decades.***⁶ (emphasis added)

⁴ California Climate Change Portal (www.climatechange.ca.gov)

⁵ Cara Pike, Bob Doppelt, and Meredith Herr, *Climate Communications and Behavior Change: A Guide for Practitioners*. The Climate Leadership Initiative, 2010, p. 12.

⁶ Pew Center on Global Climate Change, *Climate Change 101: Understanding*

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At the time of the preparation of this Climate Action Plan, the United States Congress has yet to pass a mandatory climate bill, despite efforts by some senators and representatives from both major political parties. Nonetheless, many states across the nation have taken the initiative in developing and implementing a wide range of regulations, policies and programs aimed at reducing greenhouse gas emissions. These strategies can also help achieve economic, environmental and public health co-benefits.

State context

California is the nation's most populous state, with a 2010 U.S. Census count of over 37 million people, and is third largest in land area (after Alaska and Texas). The state produces roughly 6.2 percent of the country's, and 1.4 percent of the world's, greenhouse gases. Fremont is the State's 15th largest incorporated city, with an April 1, 2010 population of 214,089.

In spite of the absence of strong leadership at the federal level concerning climate change, State, regional and local leaders in California are continuing California's history of enacting environmental regulations, supporting innovative practices and the development of new technologies, and enhancing the penetration of these technologies into the market. The State has been working on climate change impacts for over two decades, culminating with the landmark California Global Warming Solutions Act of 2006 (AB 32) that directed the California Air Resources Board to establish the world's first comprehensive program of mechanisms (both regulatory and market-based) aimed at achieving greenhouse gas emission reductions in multiple sectors.

In July 2011, the Public Policy Institute of California, a nonprofit, nonpartisan research institution, published its 11th annual statewide survey titled *Californians and the Environment*. Among the survey's findings were the following:

☞ ***California is a pioneer in addressing global warming.*** California has a history of enacting environmental policies that are more stringent than national policies. "The principle behind AB 32—the California law requiring the state to reduce greenhouse gas emissions to 1990 levels by 2020—enjoys majority support (67% favor, 21% oppose, 11% don't know). Most (57%) believe that the state government should make its own policies, separate from the federal government's, to address global warming" (p. 4).

☞ ***Californians see global warming as a threat to their daily lives.*** "Three in four Californians believe that global warming is a serious threat to the state's future economy and quality of life: 47 percent say very serious and 28 percent say somewhat serious" (p. 16).

☞ ***In order to deal with global warming, Californians prefer a mix***

and Responding to Global Climate Change, January 2009, p. 9.

of regulating the private market and local government action.

“More than half of Californians (56%) and likely voters (53%) say the federal government is not doing enough to address global warming. . . . Just under half of Californians (47%) say that state government is not doing enough to address global warming” (p. 20).

- ≈ Strong majorities favor several options under discussion at the state and federal level to address climate change: requiring utilities to increase their use of renewable energy (82%), industry to reduce emissions (82%), and automakers to reduce emissions from new cars (81%); encouraging local governments to change the way they plan so as to reduce driving (79%); and requiring buildings and appliances to be more efficient (74%)” (p. 4).
- ≈ Also, the study notes that “Californians are more likely to trust local government (35%) than the state (24%) or federal governments (20%) to deal with environmental problems” (p. 9).
- ≈ ***The majority of Californians wants immediate state action to reduce global warming, and believe that state action to reduce global warming would affect the job market in a beneficial or neutral way.*** “Nearly six in 10 Californians (58%) also say the state should take action right away to reduce greenhouse gas emissions, whereas 38 percent say the state should wait until the economy and job situation improve. . . . How do Californians think action to reduce global warming would affect employment? Nearly half (47%) say that the state taking action would result in more jobs for Californians and 23 percent say it would result in fewer; 20 percent say there would be no change” (p. 17).

There are several take-away messages from this study for the community of Fremont. Clearly, citizens understand that there is no one answer to dealing with global warming, and that a cross-sector approach will be vital to success. The various actions for reducing greenhouse gas emissions in the Climate Action Plan are consistent with this approach. As an initiative of local government, the most-trusted level of government by citizens looking for action on reducing greenhouse gas emissions, the Climate Action Plan is an important step in framing the City’s approach to addressing global warming.

The State of California has adopted executive orders and enacted legislation for the purpose of reducing greenhouse gas emissions statewide. These actions address issues such as vehicle efficiency standards (AB 1493), fuel efficiency (Low Carbon Fuel Standard), changes in land use patterns to reduce vehicle miles traveled (SB 375), transforming the State’s power supply to increasing levels of renewable energy sources (Renewables Portfolio Standard), and reducing urban per capita water use (SBx 7-7). These are not the only strategies which will be pursued, nor can any one strategy, on its own, allow California to reach its reduction goals. Some strategies, such as the State-sponsored “Just

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Check It” program addressing proper vehicle tire inflation, rely on individuals’ behaviors for their success.

Examples of key State actions pertaining to greenhouse gas emissions include:

Assembly Bill (AB) 1493 (Pavley) (2002)

This 2002 bill, named after its author, California State Senator Fran Pavley, directed the California Air Resources Board (ARB) to adopt regulations requiring the maximum feasible and cost-effective reduction of greenhouse gas emissions from new light duty vehicles, beginning with model year 2009. As the implementing agency, ARB is responsible for identifying approaches, such as engine design specifications and devices that reduce aerodynamic drag and rolling resistance, which would accomplish tailpipe emission reductions. Lawsuits brought by automakers and delays caused by the U.S. Environmental Protection Agency resulted in a May 19, 2009 agreement among the parties, and the granting of a waiver on June 30, 2009. It is now expected that the implementation of regulations developed by ARB, as directed by AB 1493, will reduce greenhouse emissions from passenger cars, light trucks and sport utility vehicles by about 22 percent in 2012 and about 30 percent in 2016, with the additional benefits of improving fuel efficiency and reducing drivers’ costs.

Renewables Portfolio Standard (RPS) (2002)



California’s Renewables Portfolio Standard was first established in 2002 under Senate Bill 1078, and then accelerated in 2006 under Senate Bill 107. This program originally required the State’s seven investor-owned utilities (including PG&E, which provides power to the City of Fremont), electric service providers (non-utility entities that offer electric service to customers within the service territory of an electric utility), and community choice aggregators (which allows cities and counties to aggregate the buying power of individual customers within a defined jurisdiction in order to secure alternative energy), to increase procurement from eligible renewable energy resources by at least 1% of their retail sales annually, until they reach 20% by 2010. Renewable energy sources

include solar, geothermal, wind, biomass and small-scale hydroelectric.

Under Executive Order S-14-08, signed by Governor Schwarzenegger in November 2008, the standard was raised to 33% by 2020. The standard was codified by SB2X (originally SBX 1-2), approved by the Legislature on March 30, 2011 and signed into law on April 12, 2011 by Governor Jerry Brown.

Executive Order S-3-05 (2005)

Executive Order S-3-05, signed by Governor Arnold Schwarzenegger in June 2005, established the statewide target for reducing greenhouse gas emissions to 1990 levels by 2020, and to 80 percent below 1990 levels by 2050.

The California Global Warming Solutions Act of 2006 (Assembly Bill (AB) 32)

The *California Global Warming Solutions Act of 2006*, commonly known as Assembly Bill 32 (AB 32), was signed into law by Governor Schwarzenegger in September 2006. AB 32 requires California to reduce statewide GHG emissions to 1990 levels by 2020. AB 32 directed the California Air Resources Board to accomplish the following core tasks:

- ≈ Establish the State-wide goal of reducing GHG emissions.
- ≈ Establish a mandatory reporting system to track and monitor emissions levels.
- ≈ Develop various compliance options and enforcement mechanisms.

In response, in December 2008, ARB adopted a Climate Change Scoping Plan that outlines how it will guide California in efforts to reduce greenhouse gas emissions. The Scoping Plan encourages local governments to align land use, transportation, and housing plans to minimize vehicle trips. Already underway, the Scoping Plan employs a range of approaches, such as voluntary, regulatory, and incentive-based, to achieve targeted reductions in various sectors.

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Executive Order S-01-07: The Low Carbon Fuel Standard (LCFS) (2007)

Executive Order S-01-07, signed by Governor Arnold Schwarzenegger in January 2007, established the statewide goal for reducing the carbon intensity of California's transportation fuels by at least 10 percent by 2020. The *Low Carbon Fuel Standard* (LCFS) is the world's first greenhouse gas standard for transportation fuels, and is another example of California's leadership in greenhouse gas emission reductions and the development and deployment of alternative fuel sources to meet transportation needs.

As noted by ARB in December 2008: "With close to 16 billion gallons of gasoline and approximately 4 billion gallons of diesel sold per year, sales of petroleum-based fuels make up approximately 96 percent of all transportation fuel sold in California. The LCFS is a key part of the State's strategy to reduce GHG emissions from the transportation sector and is being developed to reduce the carbon intensity of the State's transportation fuels by at least 10 percent by 2020."⁷

On December 29, 2011, U.S. District Court for the Eastern District of California issued several rulings in the federal lawsuits challenging the Low Carbon Fuel Standard. The Court ruled that the LCFS violated the Commerce Clause of the U.S. Constitution. Soon after the court issued its ruling, the California Air Resources Board declared that it will seek a stay of the preliminary injunction when it appeals the decision. In the interim ARB has stated that it will withhold enforcement of the LCFS requirements.

Senate Bill 375 (SB 375) (2008)

Governor Schwarzenegger signed Senate Bill 375 into law in 2008. SB 375 builds on the existing regional transportation planning process to connect the reduction of greenhouse gas emissions from cars and light trucks to land use and transportation policy. The City of Fremont's Updated General Plan reflects these principles in many goals, objectives and policies.

Implementation of SB 375 is underway. On September 23, 2010, the Air Resources Board adopted targets for reducing greenhouse gas emissions associated with passenger vehicle travel (which are a major emissions source) by the years 2020 and 2035. ARB also adopted targets for the state's 18 Metropolitan Planning Organizations; the Bay Area's targeted reductions of 7 percent (2020) and 15 percent (2035) were among the most aggressive. For the nine-county San Francisco region, the bill requires the Metropolitan Transportation Commission (MTC), the regional transportation planning agency, and the Association of Bay Area Governments (ABAG), the regional planning agency, to adopt a *Sustainable Communities Strategy* (SCS) which integrates MTC's Regional Transportation Plan (RTP) with ABAG's *Regional Housing*

⁷ Climate Change Scoping Plan, Appendices Volume I: Supporting Documents and Measure Detail, p. C-64.

Needs Allocation process. Adoption of the SCS/RTP is anticipated to occur in 2013.

SB 97 and California Environmental Quality Act Guidelines (2007)

California Senate Bill SB 97 was enacted in 2007. This bill directed the adoption of amendments to the California Environmental Quality Act (CEQA) Guidelines for greenhouse gas emissions. In June 2010, the Bay Area Air Quality Management District adopted updated CEQA guidelines which, for the first time, addressed greenhouse gases. The overall goal is to ensure that new development projects implement appropriate and feasible emission reduction measures to mitigate significant air quality impacts. The guidelines establish greenhouse gas thresholds to support the Bay Area's efforts to meet the State's goals addressing climate change.

SBx7-7: The Water Conservation Act of 2009

California Senate Bill 7 (SBx7-7), *The Water Conservation Act of 2009*, was enacted in November, 2009. SBx7-7 requires the state to reduce per capita water consumption by 20% by the year 2020, regardless of the sufficiency of existing water systems. The state would also be required to make incremental progress towards this goal by reducing per capita water use by at least 10% on or before December 31, 2015.

Many of these bills and regulations are discussed in more detail in relevant chapters of the Climate Action Plan.

City of Fremont's Approach to the Climate Action Plan: Five Milestones

In 2008, the City of Fremont joined ICLEI – Local Governments for Sustainability (formerly named ‘International Council for Local Environmental Initiatives’), and agreed to participate in the Alameda County Climate Protection Project. The Climate Protection Project was launched by ICLEI in partnership with StopWaste.Org (the Alameda County Waste Management Authority and the Alameda County Source Reduction and Recycling Board operating as one public agency), and the Alameda County Conference of Mayors. In committing to the project, the City of Fremont embarked on an ongoing, coordinated effort to reduce greenhouse gas emissions, improve air quality, reduce waste, cut energy use and save money.

Similar to other cities in California and across the nation, Fremont's approach to climate action planning is based on ICLEI's ‘Five Milestone’ process:

- ∞ **Milestone 1:** Conduct a baseline greenhouse gas emissions inventory and forecast
- ∞ **Milestone 2:** Adopt an emissions reduction target
- ∞ **Milestone 3:** Develop a Climate Action Plan for reducing emissions
- ∞ **Milestone 4:** Implement policies and measures
- ∞ **Milestone 5:** Monitor and verify results

Milestones 1 and 2 are discussed in the section that follows. This document is the realization of Milestone 3. Milestone 4 and Milestone 5 will occur following adoption of the Climate Action Plan.

Milestone 1: 2005 Baseline Inventory of Greenhouse Gas Emissions

The purpose of the baseline emissions inventory is to determine the levels of greenhouse gas emissions that the City of Fremont emitted in its base year, 2005, on a municipal operations level and a community-wide level. The city chose 2005 as the base year for the inventory, in order to be consistent with other cities in Alameda County which were preparing emissions inventories. The city partnered with ICLEI – Local Governments for Sustainability for completion of the inventory, which used the Clean Air and Climate Protec-

tion (CACP) software package developed by ICLEI⁸. This software package is a tool used by hundreds of cities and counties around the country to develop a sector-based emissions inventory. However, it is worth noting that calculating emissions with precision is difficult, and that the final inventory will not ‘tell the whole story’ of a jurisdiction’s emissions. The model depends on numerous assumptions and is limited by the quantity and quality of available data.

Therefore, **it is most useful to think about any specific numbers describing greenhouse gas emissions in the Climate Action Plan as an approximation, rather than an exact value.** These numbers provide a sense of the *magnitude of scale* of the challenge to reduce greenhouse gas emissions which faces the City of Fremont, and of the *opportunities* which the Plan’s proposed actions offer to help the City work towards achieving its reduction goals. The Climate Action Plan includes estimates of potential greenhouse gas emission reductions for several actions. Staff used the Climate and Air Pollution Planning Assistant (CAPPA), a tool developed by ICLEI that helps model emission reductions in different sectors, to prepare these estimates.

The baseline inventory provides information on the Fremont’s emissions from several sectors – residential, commercial, industrial, transportation and waste – as well as for City of Fremont municipal operations. This information will allow the City to assess its progress in reducing greenhouse gas emissions in both City operations and in the community as whole, when future updates to the emissions inventory are completed. The Baseline Greenhouse Gas Emissions Inventory Report can be found on the City’s website (www.fremont.gov). The inventory will be updated periodically and the most current version will be posted on the City’s website when it becomes available.

A note about numbers: Fremont’s Climate Action Plan includes numbers expressing quantities of greenhouse gas emissions in four key areas: 1) the 2005 Baseline Inventory of Greenhouse Gas Emissions; 2) the modeling of projected future emissions and the City’s adopted emissions reduction goal; 3) the quantification of some of the proposed actions for reducing greenhouse gas emissions; and 4) the quantification of the potential greenhouse gas emissions resulting from the implementation of various external initiatives, such as the Renewables Portfolio Standard.

⁸ The CACP software was developed by ICLEI in partnership with the State and Territorial Air Pollution Program Administrators, the Association of Local Air Pollution Control Officers, and Torrie Smith Associates.

Key Findings from the 2005 Emissions Inventory

Community-level emissions for 2005 totaled approximately 1,660,000 metric tons of carbon dioxide equivalent (MTCO₂e)⁹. At that time, Fremont had just over 70,000 households and a total population of approximately 210,000, as well as many millions of square feet of commercial, industrial and institutional buildings used by employees and customers – all contributing to the community’s greenhouse gas emissions. City of Fremont (municipal) operations generated approximately 7,400 MTCO₂e, or less than 1% of total emissions throughout the City. Completing separate emissions inventories for community and municipal operations has advantages for future priority-setting and program implementation. Since the City of Fremont has a higher degree of control over the municipal activities and facilities that create greenhouse gas emissions than it does over those within the community at large, it can show leadership and commitment while monitoring progress against the municipal baseline inventory as emission reduction initiatives are implemented. However, since community-wide emissions comprise over 99% of all emissions in Fremont, the community at large, including other agencies, will need to play an active role in finding and implementing solutions.

Figure 1-3 provides a visual representation of the volume occupied by one ton of an atmospheric gas, such as carbon dioxide.

⁹ CO₂e, or ‘carbon dioxide equivalent’, is a measurement that allows for the direct comparison of the impacts of different greenhouse gases. Some gases are more potent than others, meaning they have a higher global warming potential than others. For example, methane is 21 times more potent than carbon dioxide, and hydrofluorocarbons, used in air conditioning systems for cars and trucks, are 1,300 times more potent than carbon dioxide. The international reporting standard for carbon dioxide emissions is in “metric tons” (MT). Therefore, figures for greenhouse gas emissions in the Climate Action Plan will be expressed in metric tons of carbon dioxide equivalent, or MTCO₂e.

Figure 1-3

What One Ton of CO₂ Looks Like



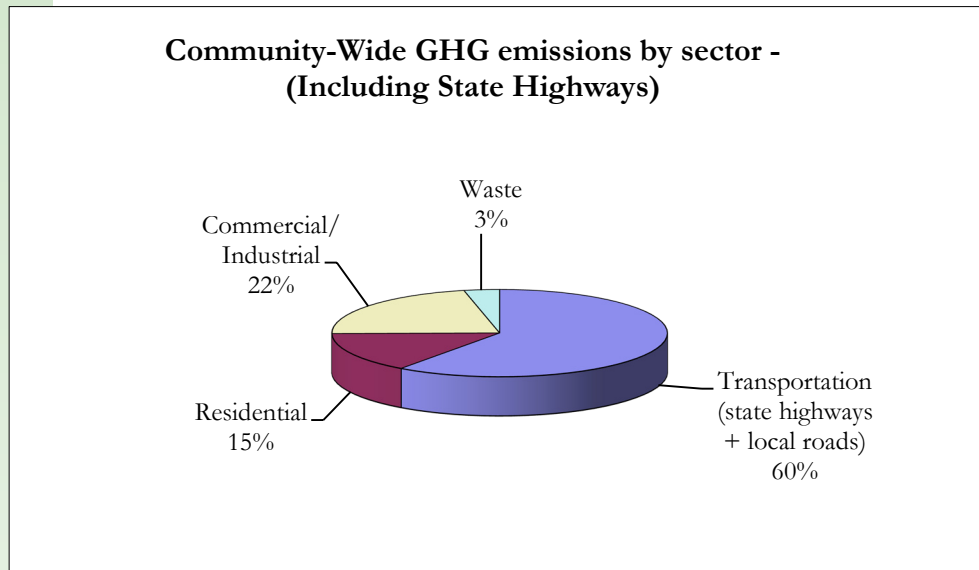
Image Source: www.energyrace.com

Since one U.S. ton (2,000 pounds) is equivalent to 0.91 metric tons, this image can be considered an accurate representation of the volumes of greenhouse gases in the atmosphere, and may be useful to the reader for visualizing quantities of greenhouse gas emissions as discussed in this Climate Action Plan and elsewhere. Annually, each Fremont citizen emits about 10 of these ‘cubes’ in greenhouse gas emissions.

Figure 1-4 reflects data from the 2005 baseline inventory, and shows three sectors’ contributions to the community’s inventory of nearly 1.7 million metric tons of carbon dioxide equivalent. (“Commercial/industrial” and “residential” are both in the ‘energy’ sector). The use of fossil fuels in vehicles and for energy use in buildings and other facilities (for heating, cooling, lighting, office equipment, water and wastewater) is the major contributor to Fremont’s greenhouse gas emissions inventory. The transportation sector is the single largest contributor at 60%, with building energy use contributing 37%, and solid waste contributing approximately 3% of the total.

Figure 1-4

Community Emissions: Total Greenhouse Gas Emissions by Sector, 2005



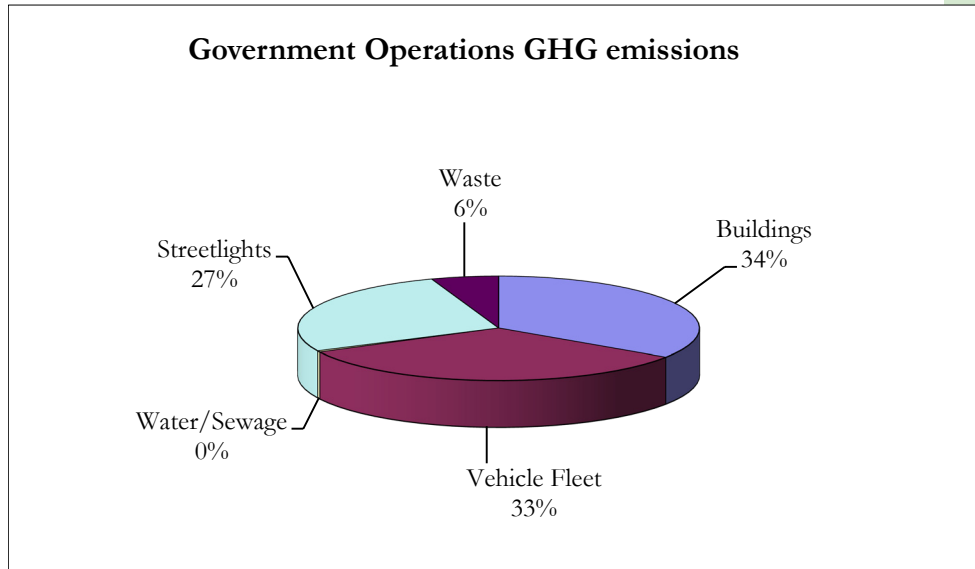
Municipal (Government) Operations: Greenhouse Gas Emissions Inventory

Greenhouse gas emissions inventories for municipal operations can vary significantly between jurisdictions. A key distinction derives from the provision of public services such as water, wastewater, solid waste collection, and transportation. In Fremont, Union Sanitary District provides wastewater services; Alameda County Water District provides water services; and Allied Waste provides solid waste services. While these organization's operations generate greenhouse gas emissions, those emissions will not be reflected in the City of Fremont's municipal inventory. In addition, unlike other cities, Fremont does not have an airport or port to account for in either the municipal or community inventory. Therefore, direct comparison of emissions inventories between jurisdictions should be undertaken with caution.

Figure 1-5 reflects data from the 2005 baseline inventory for municipal operations.

Figure 1-5

Municipal (Government) Operations: Total Greenhouse Gas Emissions by Source, 2005



The City of Fremont's strategies for reducing greenhouse gas emissions in government operations are described in Chapter 6 of the Climate Action Plan.

Milestone 2: Adopt an Emissions Reduction Target

The second milestone in ICLEI's 'Five-Milestone' process is the adoption of a greenhouse gas emission reduction target. On November 18, 2008, the City Council adopted a goal to reduce greenhouse gas emissions 25% by 2020 from a 2005 baseline. By way of context, the State of California's emissions reduction targets, as adopted in AB 32 and Governor Arnold Schwarzenegger's Executive Order S-3-05, are as follows:

- ≈ By 2010, reduce greenhouse gas (GHG) emissions to 2000 levels;
- ≈ By 2020, reduce GHG emissions to 1990 levels (equivalent to a 12% reduction below 2005 levels); and
- ≈ By 2050, reduce GHG emissions to 80% below 1990 levels (equivalent to 83% below 2005 levels).

(Equivalency source: City of Hayward Climate Action Plan, June 2, 2009, p. xii).

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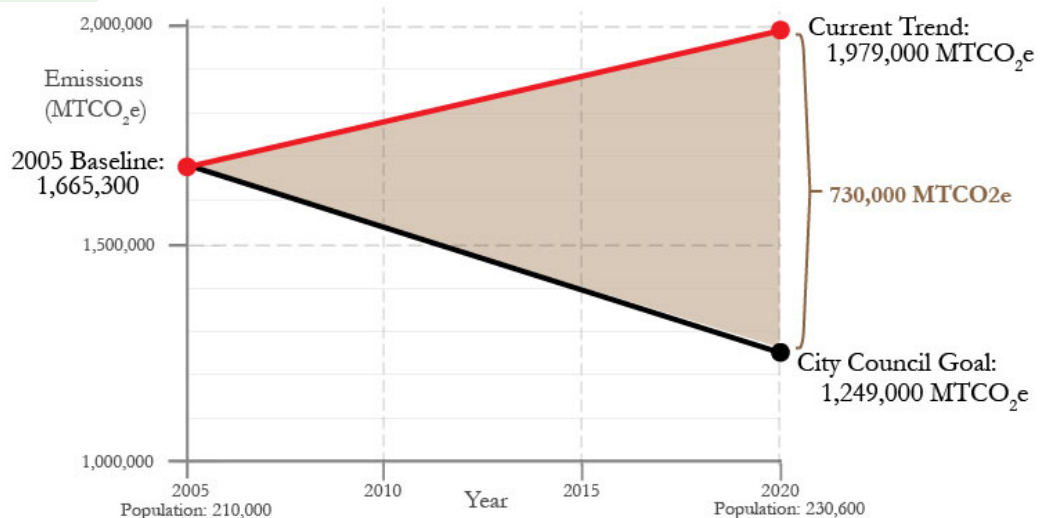
The City of Fremont's adopted goal of a 25% reduction in the City's greenhouse gas emissions by 2020, from a 2005 baseline, is more ambitious than the State's goal. With the adoption of this goal, the City Council wished to express consistency with the emission reduction goals of other participants in the Alameda County Climate Protection Project and to reflect the City's aspirations for achieving significant reductions in emissions. The City Council has not adopted a longer-term emission reductions goal, such as the 2050 target in AB 32.

The quantification of the City Council's reduction goal is illustrated in Figure 1-6. The current trend figure of just under 2 million MTCO_2e in 2020 is calculated using population and employment growth projections from the Association of Bay Area Governments. This figure reflects the level of greenhouse emissions that would result without any actions to reduce greenhouse gas emissions¹⁰.

The Council's 25% reduction goal is calculated to be 1,249,000 MTCO_2e . The difference between the current trend and the City Council's goal is approximately 730,000 MTCO_2e . This is the amount of greenhouse gas emissions that would need to be eliminated from the "business as usual" projections for the year 2020.

Figure 1-6

Calculating Fremont's Year 2020 Greenhouse Gas Emissions Reduction Goal



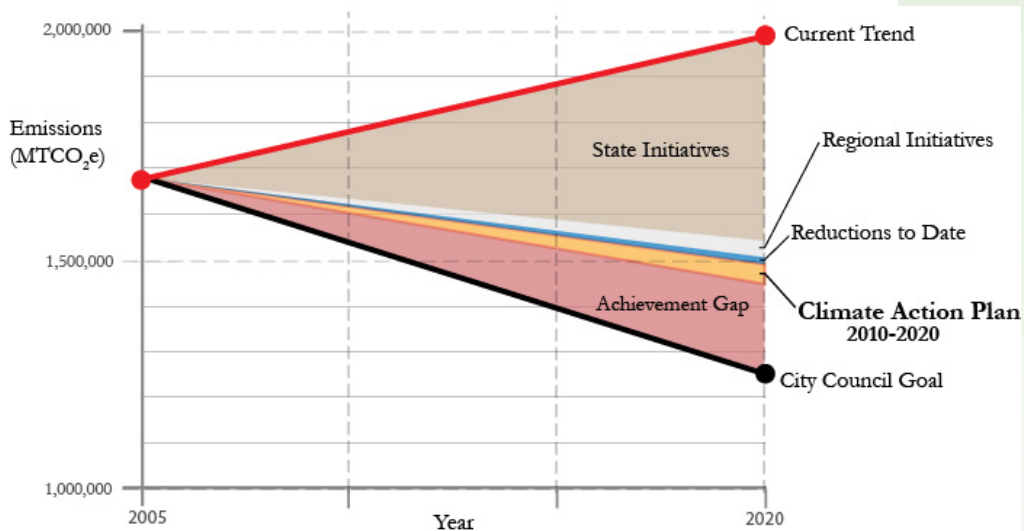
¹⁰ The 'current trend' projection also assumes no change in the 2005 PG&E emissions factor of 0.49 lbs/kWh for electricity and 53.05 kg/MMBtu for natural gas. See Chapter 3 for an explanation of the relationship between emissions factors and greenhouse gas emissions.

Figure 1-7 illustrates “The Achievement Gap” resulting from the City’s aspirational goal for greenhouse gas emission reductions; the estimates in MTCO₂e are as follows:

City Council 2020 reduction goal	730,000
State initiatives	(446,000)
Regional transportation initiatives	(37,000)
Emission reductions 2005-2010	(10,000)
Climate Action Plan actions through 2020	(47,000)

The Achievement Gap 190,000 MTCO₂e

Figure 1-7
The Achievement Gap



This figure illustrates the importance of initiatives that are outside of the control of the City (both the organization and the community at large) in achieving meaningful emission reductions. State initiatives comprise the majority of anticipated emission reductions. Although the estimates of emission reductions from local action (shown as “Reductions to Date” and “Climate Action Plan” 2010-2020) are conservative, it is evident that the scale of Fremont’s challenge is much greater than what can be achieved through local initiatives. This underscores the importance of collaborative efforts, community involvement, and advocacy by the City’s leadership at the regional and State levels in support of large-scale initiatives.

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At this point, it is unclear how the “Achievement Gap” will be closed. However, the City’s aspirations, as expressed by the adopted reduction goal, are intended to motivate and inspire action, as they reflect the community’s values and desired outcomes.

Climate Change Mitigation and Adaptation

When used in the context of climate change and global warming, the term “mitigation” means taking actions to reduce greenhouse emissions or to enhance greenhouse gas sinks (which remove carbon from the atmosphere) in order to reduce the extent of global warming, and the term “adaptation” means taking action to reduce the *vulnerability* (or susceptibility) of the built environment to the actual or expected effects of climate change, or by increasing *resiliency* (that is, the ability to ‘bounce back’ once the changes are felt). Some actions, such as restoring tidal marshes that both sequester carbon and provide flood protection, serve as both adaptation and mitigation strategies. On the other hand, some actions may be favorable for climate mitigation but unfavorable for adaptation, and vice versa. These contradictions are described in more detail in Chapter 7. Just as greenhouse gas reduction measures apply to a range of sectors (transportation, energy, waste), so do adaptation actions apply to all climate-sensitive systems of human society and the natural environment, including human health, ecosystems and wildlife, energy, coastal areas and sea level rise, water resources, and agriculture and forestry.




The Climate Action Plan, with its focus on identifying and implementing actions for reducing greenhouse gas emissions, is primarily a “mitigation” strategy. Chapter 7 includes a discussion of the issue of adaptation in a broad, high-level manner, similar to the approach taken in the Climate Action Plans prepared by the cities of Hayward and Berkeley. It should be noted that one of the Action Area Goals of the Bay Area Climate Change Compact, to which the City is a signatory, calls for the completion of adaptation plans by San Jose, San Francisco and Oakland by 2013. If these communities complete those plans, the City of Fremont would be positioned to benefit from their work.

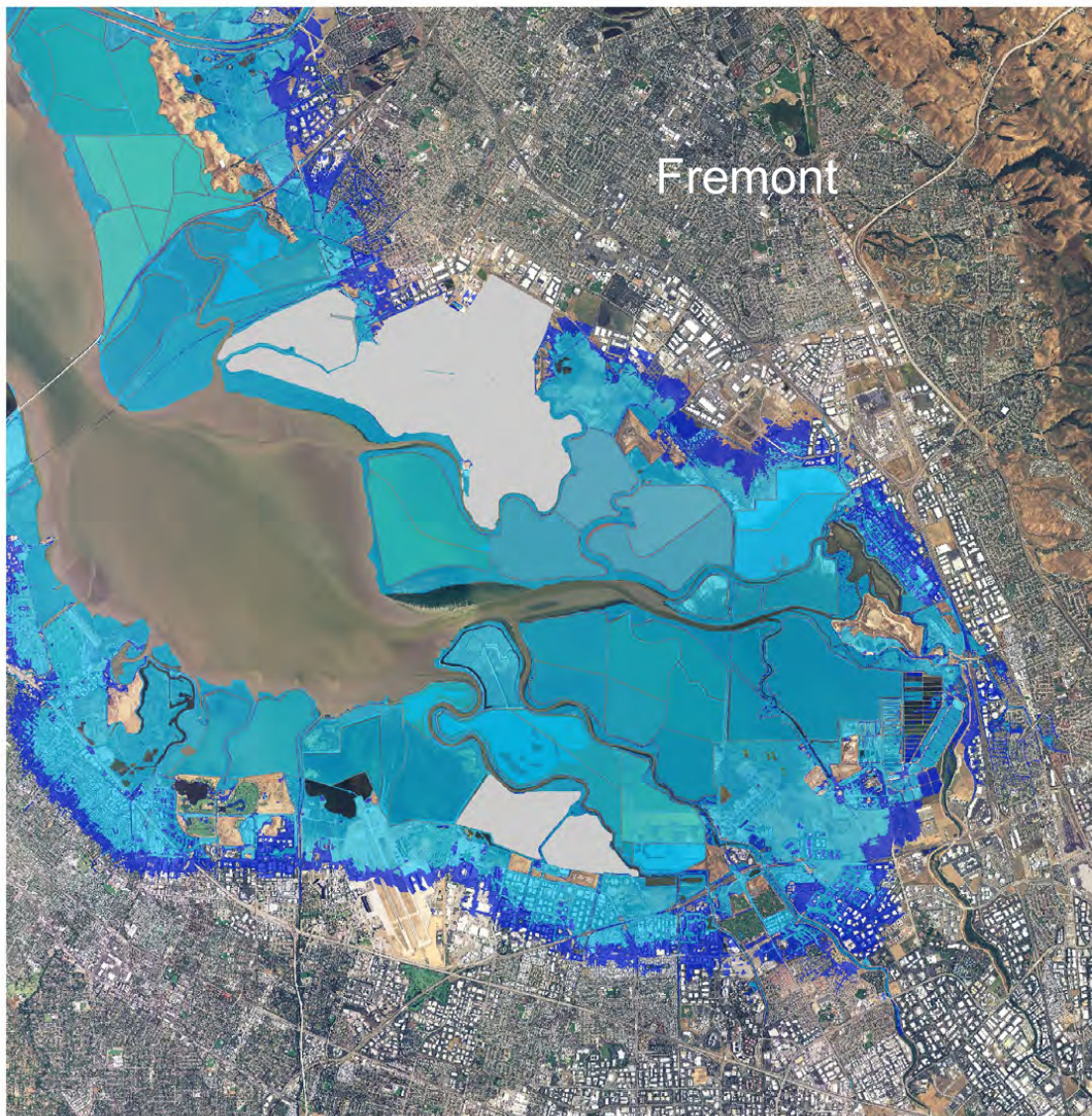
In addition, Alameda County, from Emeryville to Union City, was selected in early 2011 as the *Adapting to Rising Tides (ART) Subregion* by the sponsoring agencies - the San Francisco Bay Conservation and Development Commission (BCDC) and the National Oceanic and Atmospheric Administration Coastal Services Center (NOAA CSC) to begin planning for sea level rise and other climate change impacts. The City of Fremont, along with other Bay Area and California jurisdictions, will benefit from the research findings and lessons learned from the project. Figure 1-8 indicates the areas in Fremont which have been identified as vulnerable to sea level rise by the Bay Conservation and Development Commission (BCDC).

In the interim, individual development projects proposed in areas that may be affected by sea level rise will be evaluated for potential impacts and mitigation measures as part of the environmental review process required by the California Environmental Quality Act.

Figure 1-8

Shoreline Areas Vulnerable To Sea Level Rise: Central Bay South

-  Area vulnerable to an approximate 16 inch sea level rise
-  Area vulnerable to an approximate 55 inch sea level rise
-  No data



Source for image: Bay Conservation and Development Commission.

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Accomplishments to Date

The City of Fremont's commitment towards achieving greenhouse gas emission reductions, improvements in energy efficiency and energy conservation, cost savings, and support for the adoption of innovative technologies are reflected in the range of accomplishments described below.

Energy Efficiency and Energy Conservation in City Operations

- Through the “East Bay Energy Watch” program, a partnership of Pacific Gas & Electric and the Association of Bay Area Governments that provides assistance to local governments in reducing their energy usage, the City completed lighting retrofits at City Hall, the Development Services Center, the Police Building; and the Family Resource Center. Energy conserving window film was also installed at the Police Building and the Development Services Center.
- The retrofit of a City-owned building on Joseph Street, leased to the Tri-City Volunteers, included natural lighting and energy efficient fixtures.
- City staff instituted electronic distribution of employee paychecks in lieu of paper copy and established double-sided copying as the default print choice for most printers used throughout the organization. Both initiatives reduce paper use and operational expenses.
- The City reduced the number of its computer servers from 82 to fewer than 20. This project is expected to pay for itself in 15 months and will save the City an estimated \$60,000 annually in utility and maintenance costs.



- In 2010, the City installed a new “cool” roof at the Fremont Main Library. The new roof is designed to reflect the heat of the sun away from the building, which helps keep the building cooler and reduces the use of air conditioning.

- ≈ City staff installed several solar-powered trash compactors at various parks, lowering staff and fuel costs for the reduced number of trips needed to collect the waste.
- ≈ Through the “Flex Your Power” program, the City voluntarily reduces energy usage at PG&E’s request (primarily by raising thermostat settings and reducing air conditioning usage in City buildings) during heat waves.
- ≈ The City completed the conversion of incandescent traffic signals to light emitting diode (LED) technology, which has reduced energy consumption and greenhouse gas production by about 85%.
- ≈ The City continued its efforts to replace fossil-fuel powered fleet vehicles and maintenance equipment with alternative fuel vehicles and equipment. The fleet includes hybrid vehicles and natural gas-powered street sweepers, among others. More details about the City’s fleet can be found in Chapter 6.
- ≈ In 2011, the City was awarded grant funding from the Metropolitan Transportation Commission for the purchase of two all-electric vehicles for the City’s fleet, along with two charging stations. The City was part of a consortium of Bay Area government agencies committed to the transition of government fleets away from fossil-fuel burning vehicles.

Community Initiatives



- ≈ During the summers of 2009 and 2010, the City sponsored the *California Youth Energy Services* program in Fremont. Each summer, local youths performed free energy audits in over 200 residences and installed simple efficiency measures like fluorescent bulbs and low-flow shower heads, saving money for residents and reducing greenhouse gas emissions. In 2011, the City expanded the program to include both the summer and fall seasons resulting in upgrades to over 500 Fremont households.
- ≈ Consistent with the recommendations of the Green Task Force, the City worked with PG&E to implement the “Be Green, Save Green” program. This program provided small businesses in the Irvington District with free energy audits and low-cost upgrades.

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- Using federal stimulus funds, the City is partnering with the school district and several non-profit agencies to achieve energy conservation goals and reduce greenhouse gas emissions. The following projects received funding in 2011: Installation of solar hot water systems at the Sunrise Village homeless shelter and the Carnales Unidos Reformado Adictos (CURA) residential chemical dependency treatment facility; energy efficiency upgrades at Redwood Lodge affordable housing property; replacement of low-efficiency parking lot lights at six Fremont Unified School District facilities with high-efficiency fluorescent lights; expansion of the California Youth Energy Services program, and purchase of energy efficient kitchen appliances and installation of new “cool” roof at Irvington Presbyterian Church, site of the Tri-City Free Breakfast Program.
- Based on the results of a pilot test, which included public input provided through the City’s website, the City began installing new, energy efficient light-emitting diode (LED) streetlights on major streets in 2011.
- More than 20 Fremont businesses have received recognition for their efforts to conserve resources, minimize waste, and reduce their carbon footprint by becoming a “Certified Bay Area Green Business”.

Green Buildings, Bay Friendly Landscaping and Trees



- Fire Station #6 received Leadership in Energy and Environmental Design (LEED™) Certification in 2009, and was the first City building to achieve this standard. LEED™ is a system developed by the U.S. Green Building Council (USGBC) to categorize the level of environmentally sustainable construction in buildings. In 2011, Fire Station #2 received LEED™ Silver Certification and Fire Station #11 received LEED™ Gold Certification.
- The new sign shop at the Leon J. Mezzetti Maintenance Center was constructed using recycled materials in the flooring, walls, and ceiling, and the HVAC system is higher-efficiency than required by the building code.
- The City installed a new “cool” roof and HVAC system at the Senior Center in Central Park. Fremont is the first jurisdiction in the Bay Area to use this roofing product, which is designed to reflect the heat of the sun away from the building, which helps keep the building cooler and reduces the use of air conditioning. The project is expected to reduce heating and cooling energy consumption by 30%.

- ≈ The City Council adopted a policy requiring all municipal projects with over 10,000 square feet of landscaping to achieve a 60-point score on the Bay Friendly Landscaping checklist and to utilize all nine mandatory measures, as well as a policy requiring private projects (other than single-family homes) to meet at least seven of the nine mandatory measures. Bay Friendly Landscaping requirements help achieve greenhouse gas emission reductions by requiring the use of plant materials that require less (or no) maintenance and irrigation, thereby reducing energy and water use.
- ≈ Between 2007 and 2009, the net gain of the City's Urban Forestry Program (trees planted less trees removed) was 984 trees. Planting activities on Arbor Day 2008 and 2009 expanded the city's tree inventory by 105 trees. Trees sequester carbon from the atmosphere and help to reduce the City's level of greenhouse gas emissions.
- ≈ Two affordable housing projects significantly supported by public funding, *Eden Housing and Main Street Village*, received City approvals and scored over 100 points on the GreenPoint Rated scale, far exceeding the 50-point minimum that the City requires as a standard condition of approval.
- ≈ The City adopted the California Green Building Code (CalGreen) and adopted enhanced "Tier 1" standards for residential development, effective January 2011.



Improvements to Support Walking and Bicycling

The City received a \$342,000 grant from the Alameda County Transportation Commission for pedestrian improvements in the Irvington District. The funds will be used at six intersections along Fremont Boulevard between Grimmer Boulevard and Washington Boulevard. This segment of Fremont Boulevard is categorized in the County Strategic Pedestrian Plan as a "High Priority Transit Corridor" and as an area of significance for the commercial district. Construction is scheduled for completion in 2012.



- ≈ Sixteen bicycle lockers were installed at the Centerville Train Depot, the Park-and-Ride lot at Mission San Jose Community Park, and the Fremont Family Resource Center. Eighty-one bicycle

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racks were installed at 21 locations throughout the City, including the County libraries, city parks, community centers, and other heavily used facilities.

- Installation of 36 electronic bicycle lockers at the Fremont BART Station is anticipated to be completed by December 2011.
- The City completed improvements to Bay Street in Irvington, including a new parking lot of porous asphalt concrete underlain by a two-foot thick infiltration bed, providing on-site retention and percolation of stormwater. The project was partially funded with a \$1.6 million grant from the Metropolitan Transportation Commission's Transportation for Livable Communities program, which is aimed at creating walkable neighborhoods near transit.
- The City began design of the Grimmer Greenway project, a new bicycle and pedestrian amenity along Grimmer Boulevard that will connect the Irvington District with Central Park. The first phase, completed in 2010, improved access to Central Park for pedestrians and bicyclists.
- The City received a \$1.2 million Proposition 50 - California Rivers Parkways grant to improve public access along Sabercat Creek with a 1,250-foot trail connection under Paseo Padre Parkway. In addition to improvements to the natural habitat, the project will extend the trail connecting two pedestrian pathways, thereby increasing opportunities for people to walk.

Materials Management: Waste Reduction, Reuse and Recycling, Composting, and Diversion from the Landfill

- The City's annual pavement management program has utilized street surfacing products made from recycled waste tires. The use of these products diverts tires from landfills and provides smooth street surfaces which help maximize vehicle fuel efficiency by reducing rolling resistance.
- The City's Graffiti Abatement Program uses recycled paint to eradicate graffiti, helping to create a market for recycled products.
- The City collects food scraps at many City buildings, including City Hall, the Development Services Center, the Family Resource Center, the Maintenance Center, the Senior Center, and all fire stations. The food scraps are then composted, which diverts waste and decreases methane emissions from the landfill.
- City staff has been implementing the Environmentally Preferable



Purchasing policy since 2006, which promotes purchasing of recycled products and products that reduce waste, toxics and pollution.

- ≈ On the Washington Boulevard Grade Separation Project, approximately 15,000 cubic yards of asphalt concrete (about 1,000 truckloads) generated from removal of road surfaces were reused as sub-ballast, structural backfill, and in roadway embankments. By reutilizing the asphalt concrete, the City diverted substantial amounts of waste from the landfill, and also minimized air pollution and greenhouse gas emissions that would have been generated from trucking the material to the landfill and importing replacement material.
- ≈ The City Council adopted an ordinance, effective January 1, 2009, mandating recycling of construction and demolition debris.
- ≈ The City diverted 74% of waste from landfill in 2010, drawing closer to the longstanding goal of 75%.

Incentives to Businesses and Residents

- ≈ In July 2009, Council adopted a Clean Technology Business Tax Exemption as an incentive to attract green employers into Fremont.
- ≈ The City Council approved new building permit fee categories for solar photovoltaic panel installations in single-family residences in October 2006 and for multi-family and commercial installations in April 2008. In most cases, the new fees are lower than the previous fees, thereby making solar, a renewable energy source, a more cost-effective option for Fremont residents and businesses.
- ≈ The City participates in the *Commuter Check Program*, which allows City of Fremont employees who use BART, ACE, AC Transit and other Bay Area transit systems for their work commute to realize tax saving by buying vouchers accepted by transit operators for the purchase of transit tickets.



Leadership through Collaboration and Advocacy

- ≈ In 2005, Fremont's Mayor signed the U.S. Conference of Mayors Climate Protection Agreement which urges local actions in municipal operations to reduce global warming pollution.
- ≈ In 2007, with the financial support of StopWaste.Org, Fremont joined ICLEI, Local Governments for Sustainability and the Alameda County Climate Protection Project. The Project was launched

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by the Alameda County Conference of Mayors in partnership with StopWaste.Org. Alameda County, along with representatives from the 14 city governments within the county, collaborate on projects that are best addressed on regional scale and that aim to reduce emissions, reduce waste and energy use, and save money.

- On September 8, 2009, the City Council unanimously adopted a resolution which demonstrated its continued leadership on climate change by agreeing to become a signatory to the Bay Area Climate Change Compact and a participant in the Bay Area Climate Collaborative. The Silicon Valley Leadership Group, in association with Joint Venture Silicon Valley, initiated these strategies as a model for regional collaboration and information sharing aimed at reducing the region's greenhouse gas emissions, and to better position the region to qualify for outside funding for future initiatives.



The ongoing implementation of the actions identified in the Climate Action Plan will build on the partnerships, collaborations, innovations and strategies, and experience and successes represented by these achievements, bringing a multitude of benefits to the community and the region as a whole.

California Environmental Quality Act and BAAQMD Guidelines for Qualified Climate Action Plans

The City incorporated the Climate Action Plan into the analyses in the Environmental Impact Report (EIR) for the General Plan Update. On December 13, 2011, the City Council adopted a resolution certifying the final EIR for the General Plan Update, thereby procuring California Environmental Quality Act clearance for the Climate Action Plan. It should be noted that the CAP does not adhere to the Bay Area Air Quality Management District's (BAAQMD) Air Quality Guidelines for a qualified climate action plan. Rather, the CAP includes implementation actions for guiding the community and the City organization in efforts to reduce greenhouse gas emissions. Some actions will be implemented in the near term (one to three years following CAP adoption), some in the medium term (three to five years), and some in the long term (beyond five years). The CAP is intended to be updated and refined every five years as best practices evolve and quantitative approaches to the preparation of greenhouse gas inventories and modeling of emission reduction actions become more sophisticated.